FIVE NEW SPECIES OF *NEOTRICHIA* (TRICHOPTERA: HYDROPTILIDAE: NEOTRICHIINI) FROM SOUTHERN MEXICO AND NORTHERN BELIZE[1]

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ABSTRACT: Five new species of microcaddisflies of the genus *Neotrichia, Neotrichia amplector,* from southern Mexico, and *Neotrichia amplio, Neotrichia garra, Neotrichia mathisi,* and *Neotrichia pulgara,* from northern Belize are described and illustrated. New figures of *Neotrichia ersitis, Neotrichia okopa, Neotrichia aequispina, Neotrichia rasmusseni,* and *Neotrichia maria* are included for comparison.

KEY WORDS: *Neotrichia,* Trichoptera, Hydroptilidae, Neotrichiini, southern Mexico, northern Belize, new species.

The genus *Neotrichia* (Trichoptera: Hydroptilidae) is one of the most speciose groups of microcaddisflies (Flint *et al.* 1999). *Neotrichia* species have been collected over the whole of North America, from as far north as Saskatchewan and Maine, southeast to Florida, and west to Oregon and California (Wiggins 1998). The distribution includes Mexico, Central and South America, and representative species can be found in Cuba and nearly all the islands of the Caribbean (Harris 1990; Flint *et al.* 1999). Of the 121 nominal species of *Neotrichia,* 101 occur only in the Neotropics (Harris 1991; Frazer and Harris 1991; Morse 1993; Morse 1997; Flint *et al.* 1999; Keth 2002).

An ongoing study of *Neotrichia* systematics has led to the discovery of several new species. In this paper I describe one new *Neotrichia* species from southern Mexico and four new species from northern Belize. Descriptive terminology follows that of Marshall (1979) and Keth (2002). Type material will be deposited at The National Museum of Natural History, Smithsonian Institution (NMNH), Washington, D.C., USA and at The Frost Entomological Museum, The Pennsylvania State University (PSU), University Park, Pennsylvania, USA.

Neotrichia amplector Keth, NEW SPECIES
(Fig. 1)

Diagnosis. *Neotrichia amplector* is most similar to *N. ersitis* Denning (Fig. 2), both having short triangular inferior appendages with robust serrations along the mesal margins. Both *N. amplector* and *N. ersitis* also have ornate sclerotized ridges at the apex of the subgenital plate. *Neotrichia amplector* differs from *N. ersitis* having ventromesal folds of segment IX that embrace the subgenital plate and a lack of sclerotized, apical hooks on the apex of the phallus.

[1] Received on April 21, 2003. Accepted on December 8, 2003.

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Mailed on July 28, 2004

Male. Length 1.9 mm. 18 antennal segments. Brown in alcohol. Abdominal segments VII and VIII annular. Segment IX arising from within segments VII and VIII, anterior margin tapered to long, finger-like projection; posterior margin blunt, sclerotized in lateral view; in ventral view producing bands that wrap around base of subgenital plate to form rounded, overlapping flaps each with a single, stout seta visible between inferior appendages. Segment X fused with dorsolateral margins of segment IX, long, slender, tapered to acute apex in lateral view; in dorsal view deeply emarginate with lateral margins sclerotized. Genitalia as in Fig. 1. Subgenital plate thick, broadening slightly to apex having sclerotized, beak-like apicoventral projection in lateral view; in ventral view broad, uniform to blunt apex with long, paired apicolateral setae produced from sclerotized, ridges along apical margins. Inferior appendage short, basally rounded, rapidly constricted at 2/3 length, dorsally serrate 2/3 length to apex in lateral view; in ventral view triangular, prominently serrate along mesal margin midlength to acute apex. Bracteoles slender, somewhat spatulate in lateral view; in ventral view uniform, curved slightly to rectangular apex. Phallus long, narrow with preapical constriction giving rise to slender, round paramere; apex long, broadening slightly over entire length to membranous tip; ejaculatory duct uniform, protruding slightly prior to phallus tip.

Female. Unknown.

Larva. Unknown.

Type Material. Holotype. Mexico: Tabasco. Teapa, Grutas de Colona, Rio Puyacatengo. March 7, 1988. Barba and Barrera. 1 male (NMNH).

Etymology. Latin: of embrace, referring to the ventromesal folds of segment IX that embrace the subgenital plate.

Distribution. *Neotrichia amplector* is know only from the type locality in southern Mexico.

Neotrichia amplio Keth, NEW SPECIES

(Fig. 3)

Diagnosis. Although it is unlikely that *Neotrichia amplio* will be mistaken for *N. okopa* Ross (Fig. 4), they are somewhat similar in their triangular inferior appendages and subgenital plates lacking projections. *Neotrichia amplio* differs from *N. okopa* having many long, prominent setae on the inferior appendages, minute setae covering the surface of the subgenital plate, and sclerotized, apical ribbons on the apex of the phallus. *Neotrichia amplio* is also larger and more robust than most other *Neotrichia* species.

Male. Length 2.2 mm. 18 antennal segments. Brown in alcohol. Segments VII and VIII annular. Segment IX arising from within segment VIII, anterior tapered, angular; posterior margin blunt, sclerotized. Segment X long, basally broad, tapered and dorsally setose to slender apex that is bifid at extreme tip in lateral view; in dorsal view long, broad, uniform to bilobed apex with each lobe flared slightly at extreme tip. Genitalia as in Fig. 3. Subgenital plate uniform to blunt apex with dorsal surface covered with short, stout setae in lateral view; in ventral view slender, margins rounded to lobate apex producing long, paired, apicolateral setae; tiny, finger-like projection mesad base of each apical seta. Inferior appendage broad, curved, tapered to acute apex in lateral view; in ventral view long, broad, tapered over entire length to rounded apex, margins and surface with multiple, prominent setae; fused mesally by ornate, sclerotized ridge from base to midlength. Bracteoles short, basally slender, broadening to spatulate apex in lateral view; in ventral view stout, nearly uniform to apex, slightly divergent. Phallus long, constriction prior to apex giving rise to flat, ribbon-like paramere covered over entire length with fine, stout setae; apex long, tapered to slightly flared tip producing pair of sclerotized knife-like blades along lateral surface; superior blade long, tapered, inferior blade ½ length of superior blade, tapered only slightly to acute apex; ejaculatory duct uniform to phallus tip, protruding.

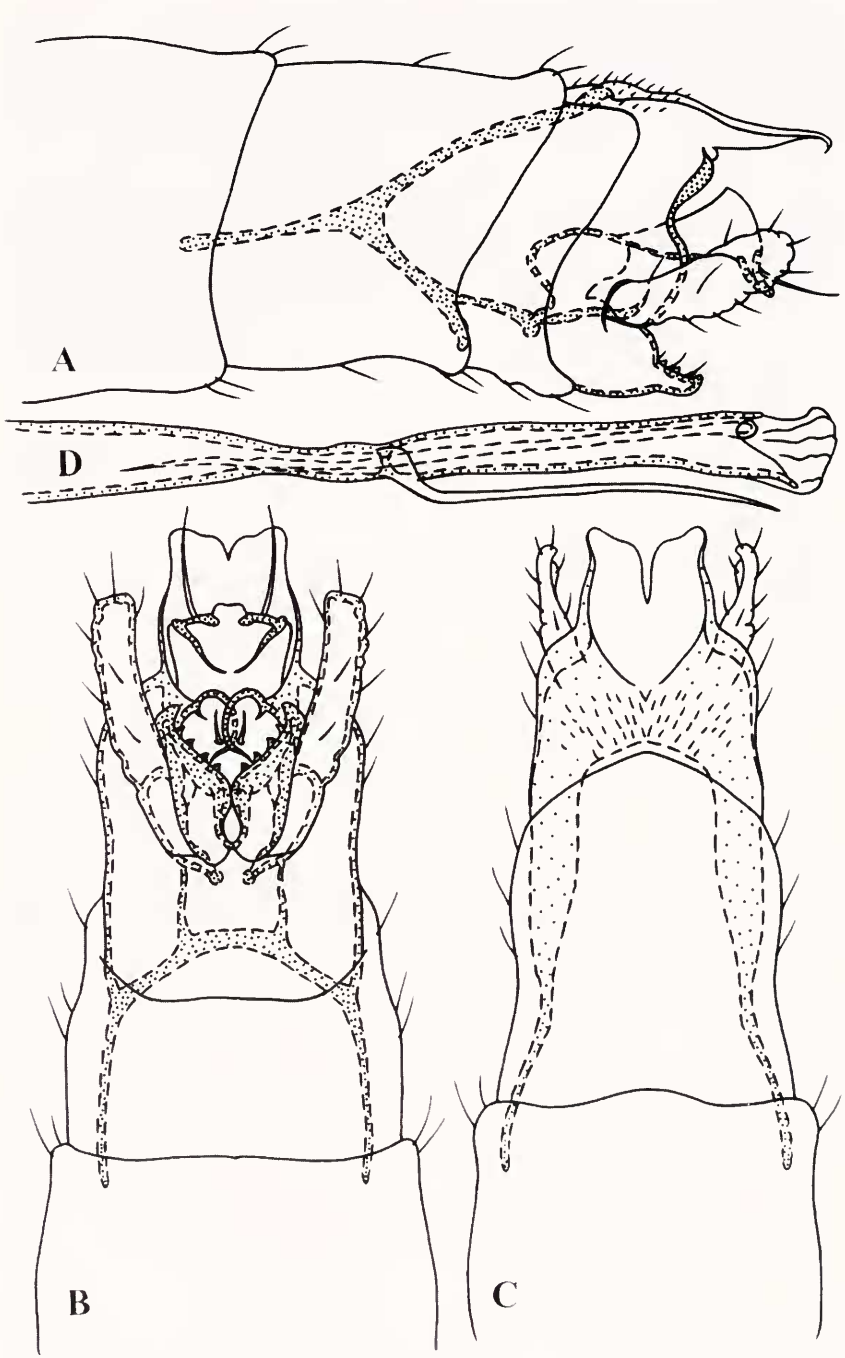

Figure 1. *Neotrichia amplector*; male genitalia. a. lateral b. ventral c. dorsal d. phallus.

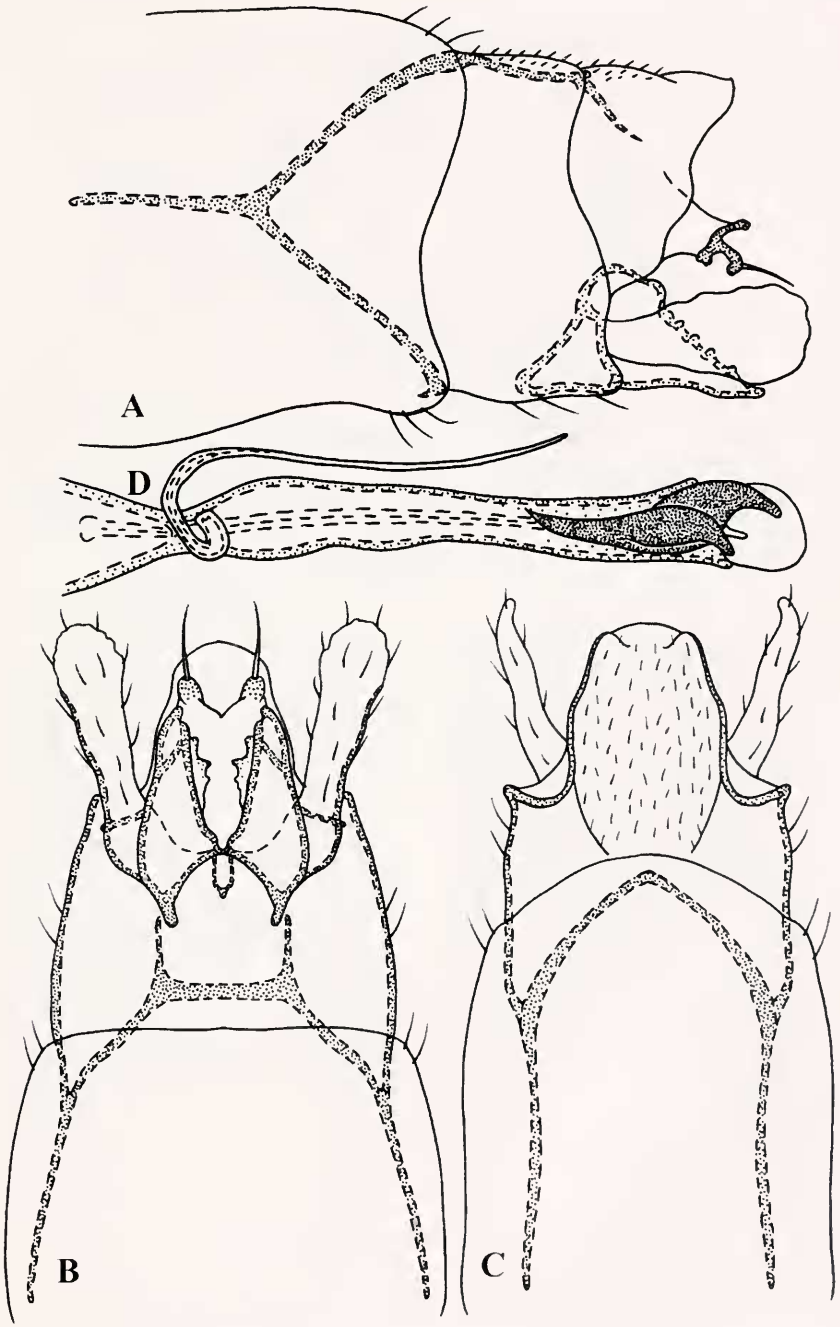

Figure 2. *Neotrichia ersitis,* male genitalia. a. lateral b. ventral c. dorsal d. phallus.

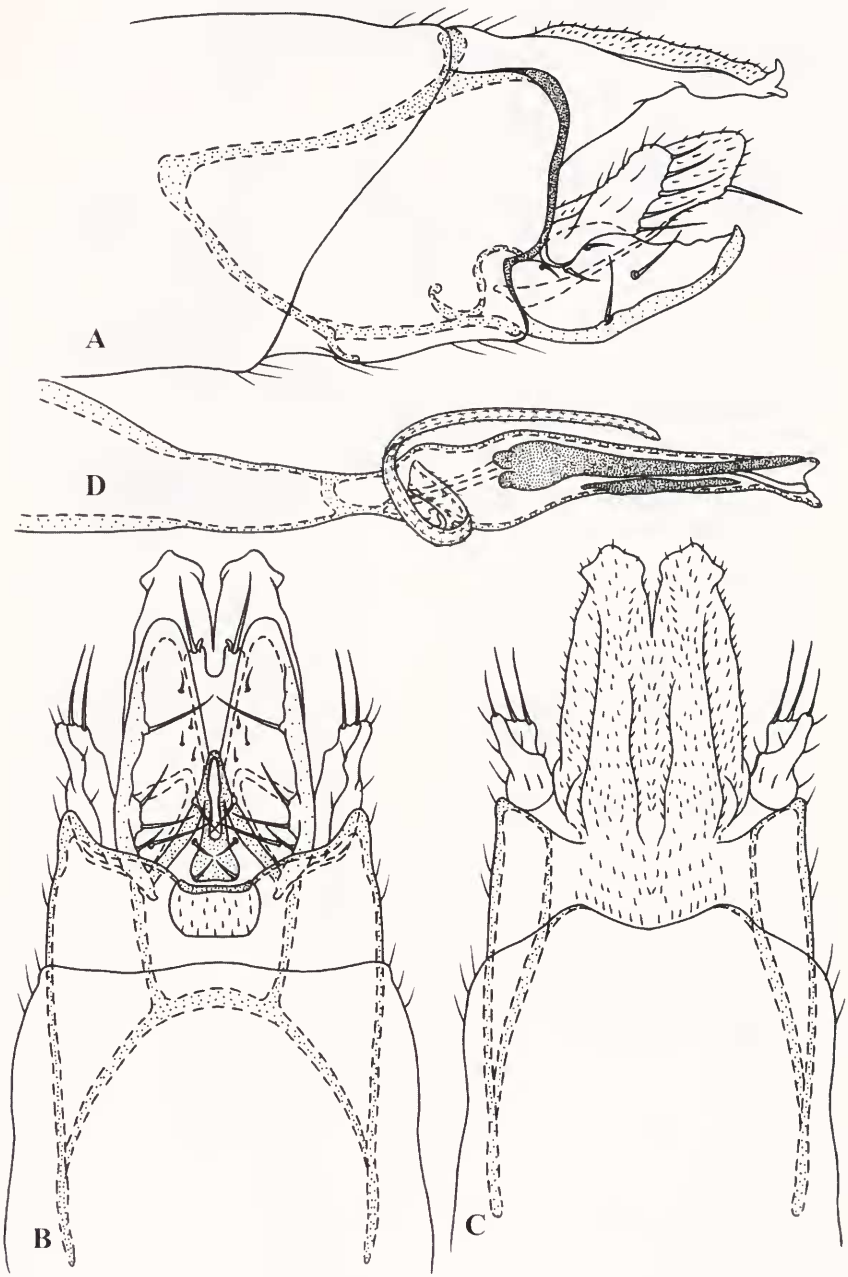

Figure 3. *Neotrichia amplio,* male genitalia. a. lateral b. ventral c. dorsal d. phallus.

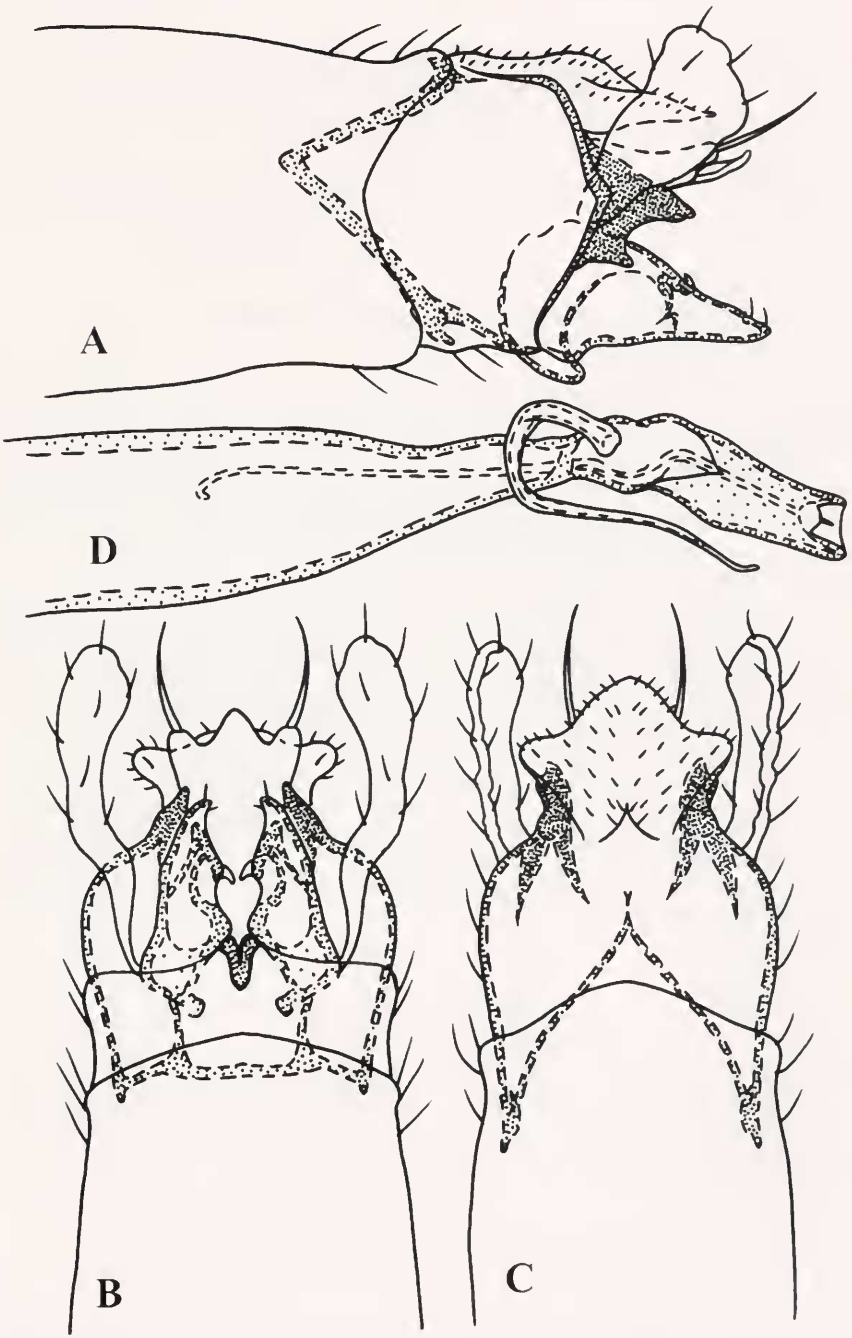

Figure 4. *Neotrichia okopa*, male genitalia. a. lateral b. ventral c. dorsal d. phallus.

Female. Unknown.

Larva. Unknown.

Type Material. Holotype. Belize: Orange Walk District. New River Lagoon, dock area at Lamanai Ruins. January 9, 1998. L. J. Davenport. 1 Male (NMNH).

Etymology. Spanish: of ample or full, referring to the robust stature of this species.

Distribution. *Neotrichia amplio* is know only from the type locality in northern Belize.

Neotrichia garra Keth, NEW SPECIES
(Fig. 5)

Diagnosis. Although it is unlikely that *Neotrichia garra* will be mistaken for *N. aequispina* Angrisano (Fig. 6), they are somewhat similar in their slender, tapered inferior appendages and the heavily sclerotized apicolateral extensions of segment IX. *N. garra* differs in the bilobed, translucent apex of segement X, the beak-like ventral projection of the apicolateral extension of segment IX, and in the tapered dorsal flap prior to the phallus tip.

Male. Length 1.9 mm. Head missing. Golden-brown in alcohol. Abdominal segments VII and VIII annular. Segment IX arising from within segments VII and VIII, anterior margin narrow, finger-like; posterior margin sclerotized, fused dorsally with segment X, producing rectangular apicolateral extension with prominent ventral beak in lateral view; in ventral view extension visible as sclerotized knob projecting mesad of inferior appendage. Segment X tapered to acute apex with translucent, flap-like extension curved dorsad in lateral view; in dorsal view constricted and laterally sclerotized to apex, deep emargination bridged by bilobed, translucent blade projecting posteriorly. Genitalia as in Fig. 5. Subgenital plate broadening slightly to blunt apex in lateral view; in ventral view broad to emarginate apex producing paired, apicolateral setae. Inferior appendage slender and tapered to acute apex, curved dorsad in lateral view; in ventral view basally broad, tapering to acute apex, divergent, with setae along mesal and apical margins. Bracteoles slender, spatulate in lateral view; in ventral view uniform, narrowed slightly at apex. Phallus long, narrow with slight preapical constriction giving rise to broad, flat paramere projected posteriorly and covered with minute setae; apex uniform with tapered, sclerotized flap produced along dorsal margin prior to tip; ejaculatory duct uniform to phallus tip, non-protruding.

Female. Unknown.

Larva. Unknown.

Type Material. Holotype. Belize: Orange Walk District. New River Lagoon, dock area at Lamanai Ruins. January 9, 1998. L. J. Davenport. 1 male (NMNH).

Etymology. Spanish: of claw, referring to the claw-like combination of the inferior appendage and apicolateral extension of segment IX in lateral view.

Distribution. *Neotrichia garra* is known only from the type locality in northern Belize.

Neotrichia mathisi Keth, NEW SPECIES
(Fig. 7)

Diagnosis. *Neotrichia mathis* is most similar to *N. rasmusseni* Harris and Keth (Fig. 8), both having reduced, knob-like inferior appendages and constricted api-

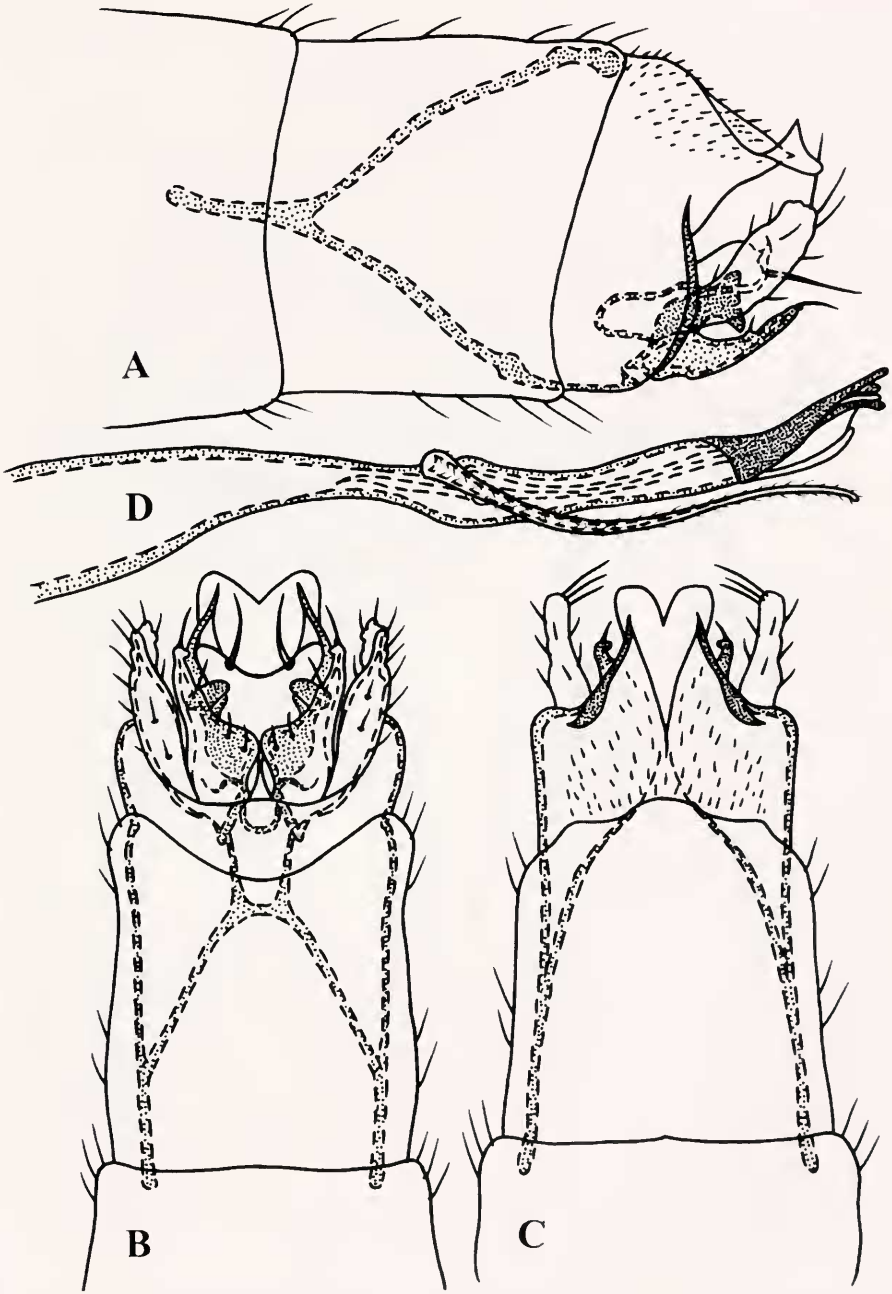

Figure 5. *Neotrichia garra,* male genitalia. a. lateral b. ventral c. dorsal d. phallus.

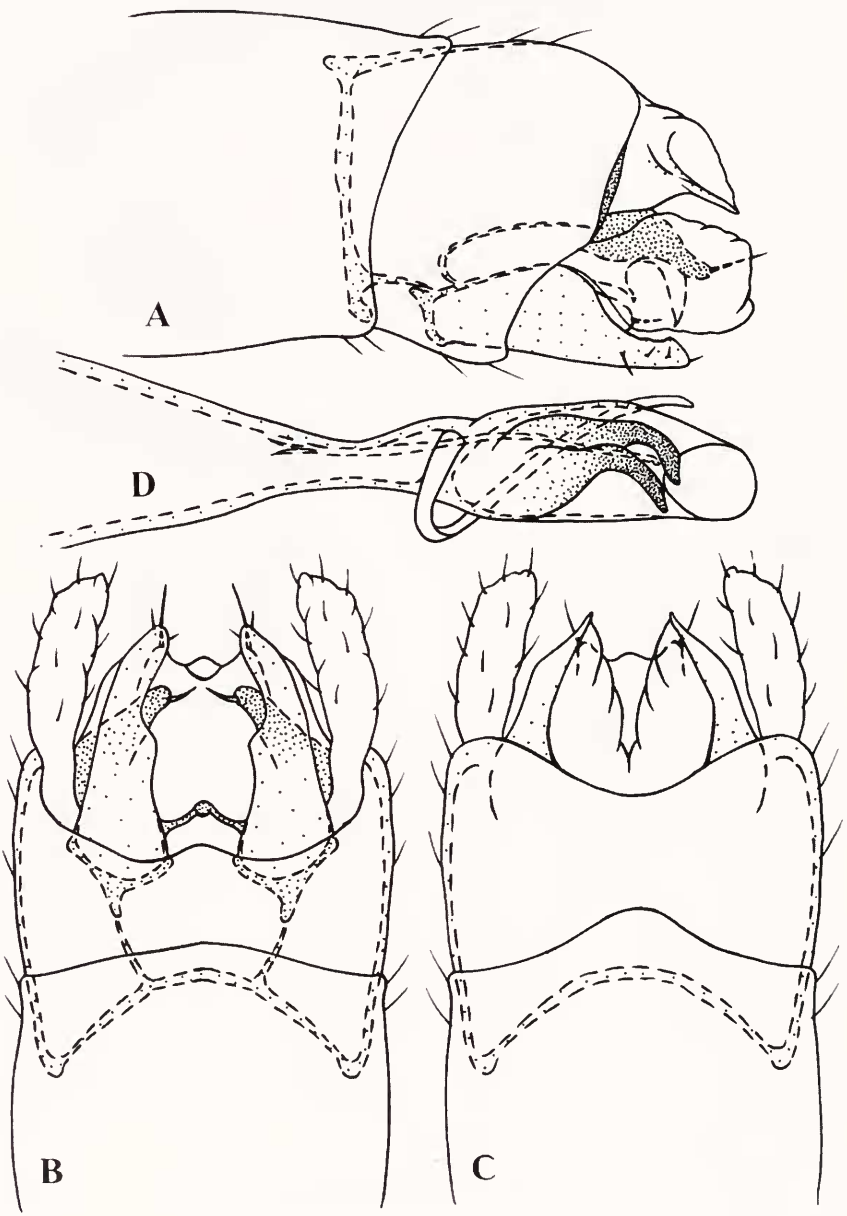

Figure 6. *Neotrichia aequispina,* male genitalia. a. lateral b. ventral c. dorsal d. phallus.

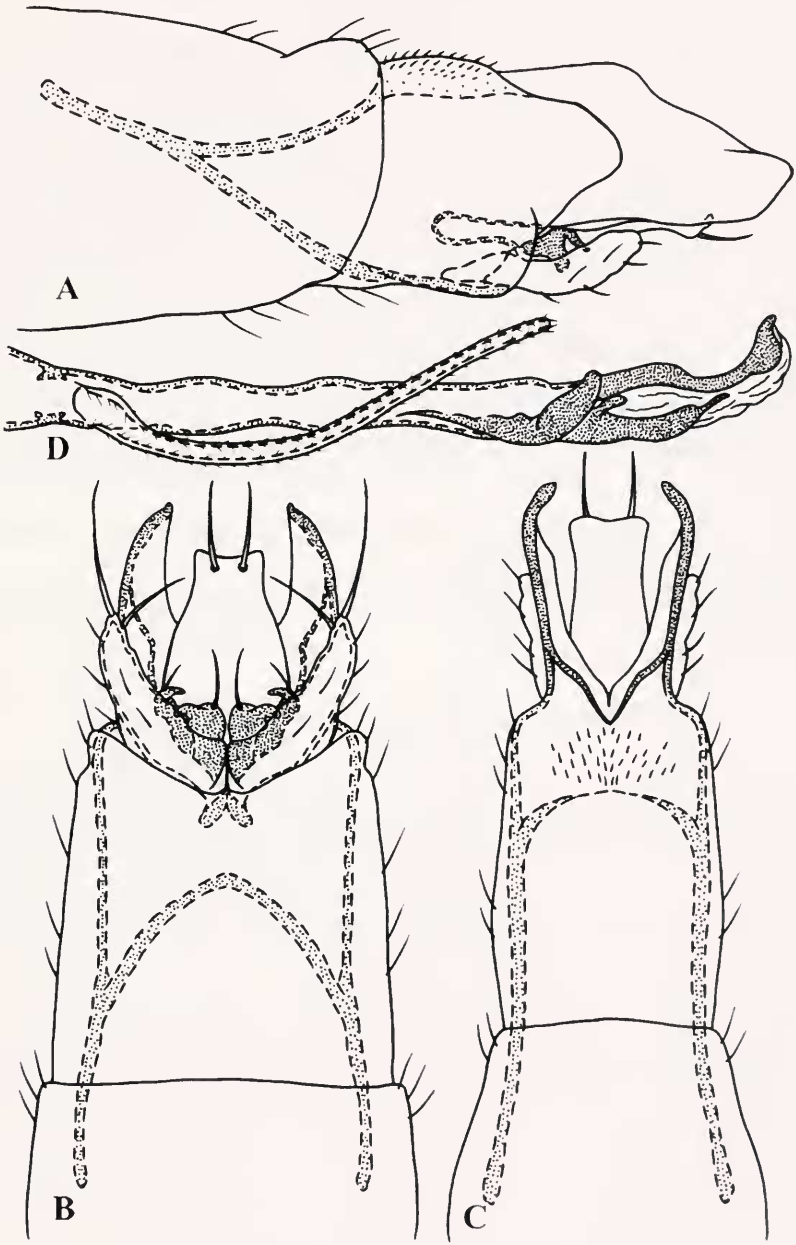

Figure 7. *Neotrichia mathisi,* male genitalia. a. lateral b. ventral c. dorsal d. phallus.

cal extensions of segment X. *Neotrichia mathisi* differs from *N. rasmusseni* in the incised apex of segment X, broad subgenital plate lacking an incision, and in the close ventromesal association of the bracteoles.

Male. Length 1.8-2.0 mm. 18 antennal segments. Brown in alcohol. Segments VII and VIII annular. Segment IX arising from within segments VII and VIII, anterior margin long, finger-like; posterior margin rounded, extending posteriorly in lateral view. Segment X fused dorsally with segment IX, long, robust, tapered to blunt apex in lateral view; in dorsal view deeply incised producing pair of long horns, curved mesad at apex with sclerous margins over entire length. Genitalia as in Fig. 7. Subgenital plate long and slender to apex flared slightly dorsad in lateral view; in ventral view broad with margins tapered to squared apex producing paired, apicolateral setae. Inferior appendage greatly reduced, sclerous, pincer-like in lateral view; in ventral view short, cushion-like with long, apicomesal seta and apicolateral finger curving mesad and producing single, apicolateral seta. Bracteoles short, nearly uniform to rounded apex in lateral view; in ventral view fused mesally at base, partially covering inferior appendages basally, divergent with two long, prominent setae at apex. Phallus long, constriction prior to apex giving rise to flat, ribbon-like paramere covered over entire length with fine, stout setae; apex long, uniform with multiple, scerotized, finger-like projections encompassing membranous tip; ejaculatory duct uniform to phallus tip, non-protruding.

Female. Unknown.

Larva. Unknown.

Material Examined. Holotype. Belize: Orange Walk District. New River Lagoon, dock area at Lamanai Ruins. January 9, 1998. L. J. Davenport, 1 male. (NMNH) Paratypes: 6 males. (3 NMNH; 3 PSU)

Etymology. Named in memory of Michael Mathis in recognition of his contributions to Trichoptera systematics.

Distribution. *Neotrichia mathisi* is know only from the type locality in northern Belize.

Neotrichia pulgara Keth, NEW SPECIES
(Fig. 9)

Diagnosis. *Neotrichia pulgara* is most similar to *N. maria* Bueno-Soria and Hamilton (Fig. 10), both having heavily sclerotized apical horns projecting from segment X. *Neotrichia pulgara* differs from *N. maria* primarily in the straight, rod-like aspect of the horns of segment X and in the long, slender phallus apex with dorsally membranous, scoop-like tip. The apical horns of *Neotrichia maria* are tapered and curved markedly mesad and the phallus apex is nearly ½ the length of that seen in *N. pulgara.*

Male. Length 1.9 mm. Antennae broken. Brown in alcohol. Segments VII and VIII annular. Segment IX arising from within segments VII and VIII, anterior margin long, finger-like; posterior margin reduced, blunt, with apicolateral extension giving rise to bracteole. Segment X fused dorsally with segment IX, long, gently curving to sclerous, thumb-like apex in lateral view; in dorsal view produced as paired, sclerotized rods with blunt, rounded apices. Genitalia as in Fig. 9. Subgenital plate long, tapering slightly to acute apex in lateral view; in ventral view broad basally, margins ventrally folded and serrate, apex highly constricted, narrowly emarginate, with paired apical setae. Inferior appendage long, narrow, having dorsal hump near midlength with 2 prominent setae projecting dorsally, tapered to acute apex in lateral view; in ventral view basally broad, rapidly constricted 2/3 length, slender 2/3 length to thumb-like apex, shorter than, but similar in appearance to, dorsoapical rods. Bracteoles short, slender, projecting somewhat dorsad in lateral view; in ventral view slender, uniform. Phallus long, slender, preapical constriction giving rise to broad, flat paramere projecting posteriorly and covered with minute setae; apex extremely long and uniform, tip dorsally

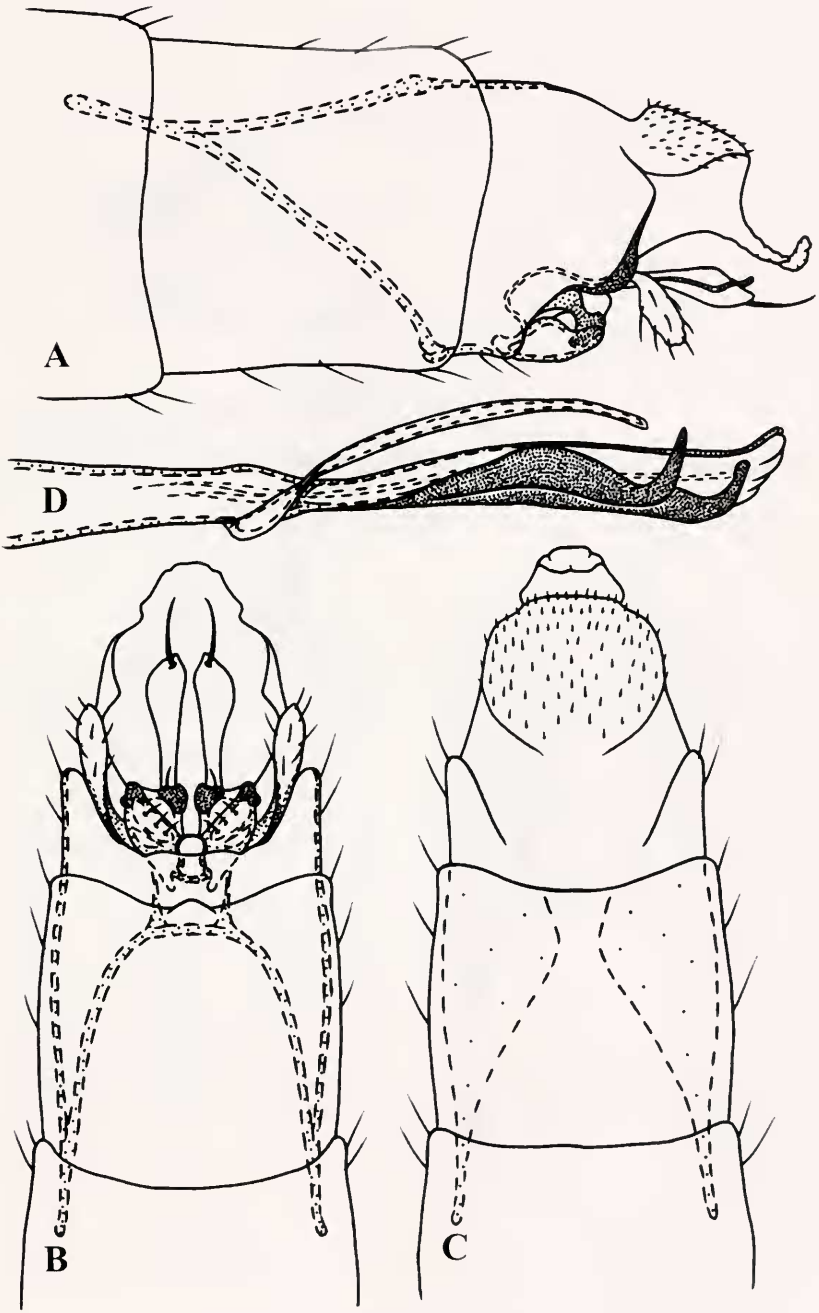

Figure 8. *Neotrichia rasmusseni,* male genitalia. a. lateral b. ventral c. dorsal d. phallus.

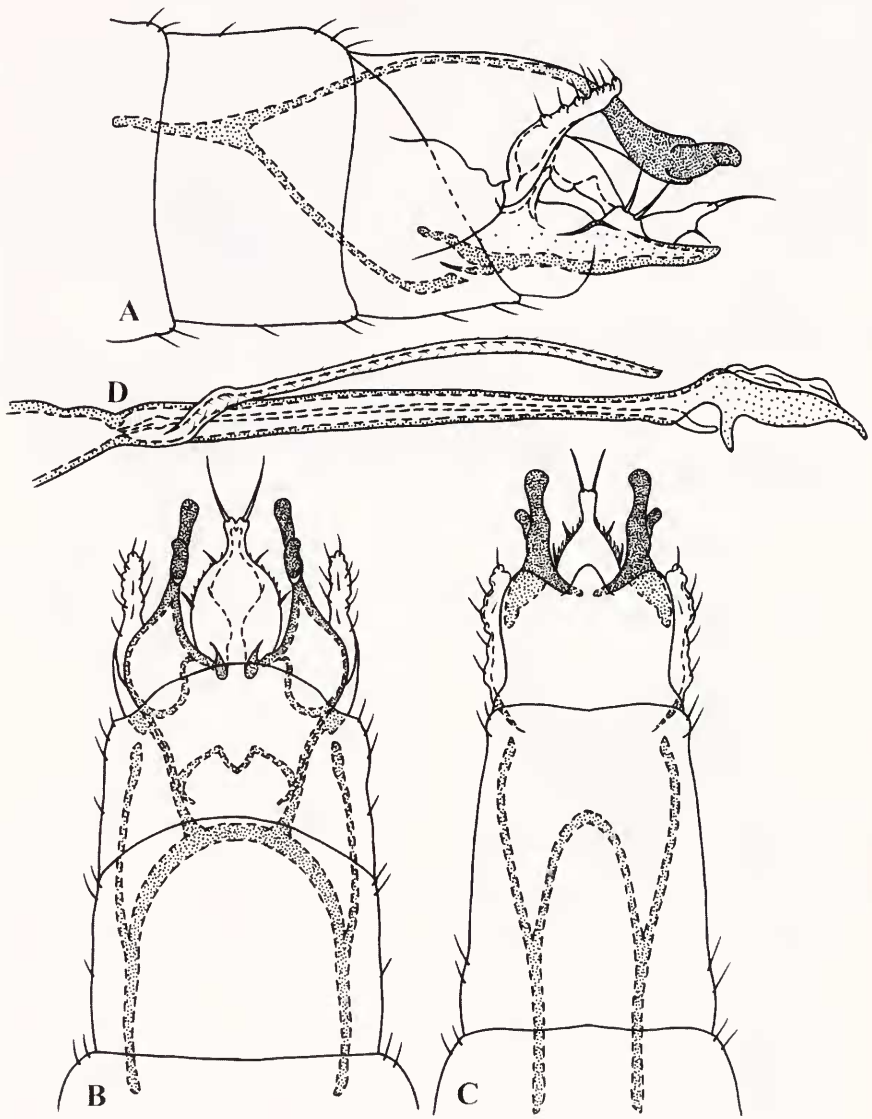

Figure 9. *Neotrichia pulgara,* male genitalia. a. lateral b. ventral c. dorsal d. phallus.

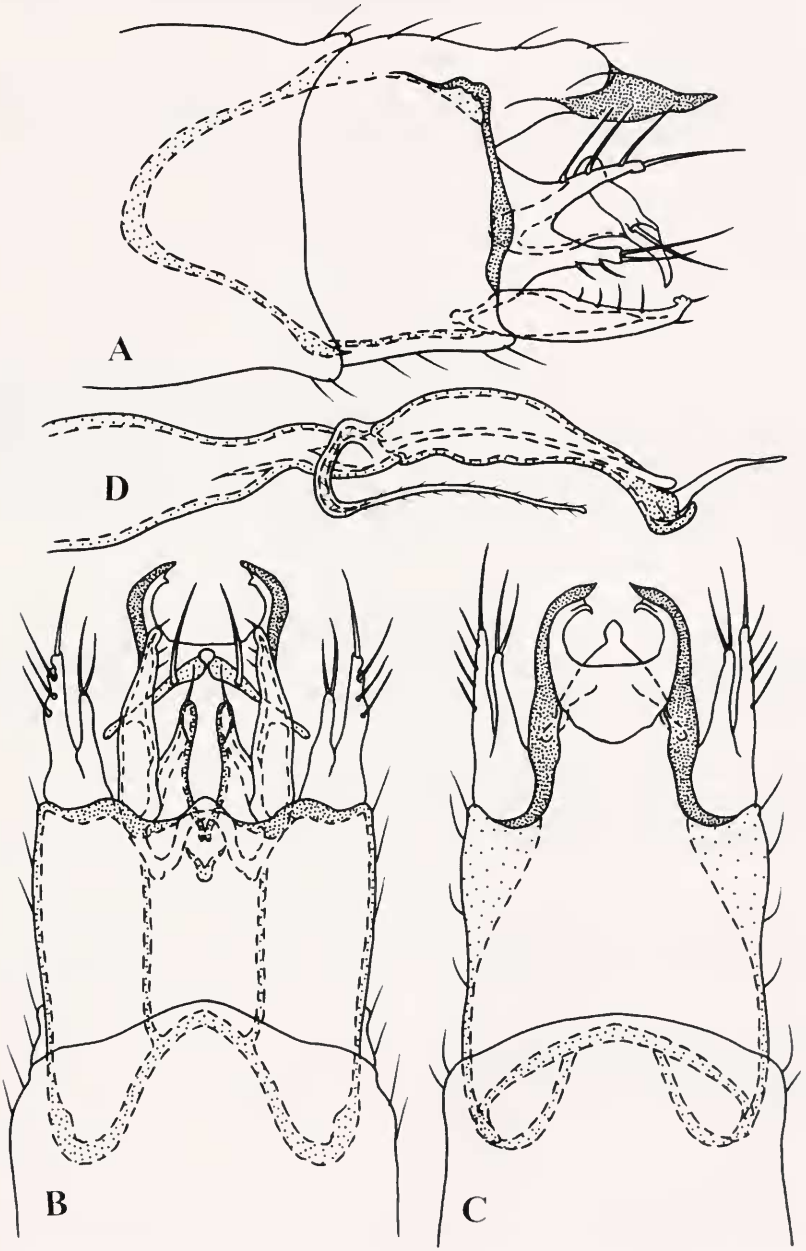

Figure 10. *Neotrichia maria,* male genitalia. a. lateral b. ventral c. dorsal d. phallus.

membranous and broadening slightly with lightly sclerous margins and finger-like processes projecting ventrally at tip base and posteriorly at extreme tip; ejaculatory duct uniform, protruding ventrad prior to phallus tip.

Female. Unknown.

Larva. Unknown.

Type Material. Holotype. Belize: Orange Walk District. New River Lagoon, dock area at Lamanai Ruins. January 9, 1998. L .J. Davenport. 1 male (NMNH).

Etymology. Spanish: of thumb, referring to the sclerotized thumb-like inferior appendages and apical extensions of segment X.

Distribution. *Neotrichia pulgara* is known only from the type locality in northern Belize.

ACKNOWLEDGEMENTS

The Pennsylvania Agricultural Experiment Station at The Pennsylvania State University supported this work. I thank Bruce McPheron for that support and I thank Steve Harris at Clarion University for the use of his lab and for critical review of the manuscript. I recognize Larry Davenport at Sanford University, Birmingham, AL, for collecting most of the material and the California Academy of Sciences, Andrew Rasmussen at Florida A&M University, the Illinois Natural History Survey, and Oliver Flint, Jr. at the National Museum of Natural History (Smithsonian) for loans of material for study.

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